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ABSTRACT

An electric preschool is a classroom or center for children 3 to 5 years of age in which the curriculum with its supportive activities, materials, and equipment depends more on technology that is powered by electricity than on manually operated objects. Certainly, preschoolers need stimulating and safe environments managed by adults who allow them to act physically, mentally, and emotionally on objects and who provide them with concrete objects and experiences that promote development. Because computers are such a central component of our society, a good preschool today and in the future must include one or more microcomputers. Teachers in those preschools must be computer-literate and able to teach computer literacy skills to young children. Early childhood educators must now consider how much of the early childhood curriculum should be experienced by children via the computer and how much through traditional play. Several advantages and disadvantages of the electric preschool and the microcomputer are evident and must be taken into account. (Directed specifically toward child advocates, workshop participants, teacher educators, early childhood teachers, and parents, concluding remarks offer suggestions focusing on young children's needs for optimum development and the advantages and concerns relative to the use of computers with preschoolers.) (RH)

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AN ELECTRIC PRESCHOOL: PROS AND CONS

Prior to the mid-1960s, preschools primarily served a social function for young children; that is, they prepared young children socially for formal school. With the initiation of Operation Head Start, the largest and most comprehensive preschool effort we've had, the function began to change. Preschools for a segment of the low-income population took on a remedial function to bridge the gap between the disadvantaged poor and the middle-class more privileged child. Both the social focus and the remedial one were based on play with children manipulating objects as they interact with adults and other children. As more and more high technology began to show up in children's toys and educational equipment, concurrently with the demand for young children to learn more at a younger age, there has been a constant shift in the preschool curriculum and its supportive resources. These changes are manifested with many early childhood educators proposing that a good preschool classroom must contain one or more microcomputers. This trend proceeds with these educators requiring that preschoolers use this equipment as a part of their instruction and learning on a daily basis. In fact, some educators and parents have asserted that preschool experiences not inclusive of the computer are inferior and help to widen the gap between the "haves" and "have-nots".

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A paper presented by Marjorie W. Lee, Ph.D., Assistant Professor of Early Childhood Education, Howard University, Washington, D.C., at the 1984 Annual Conference of the National Association for the Education of Young Children, Los Angeles, California, November 9, 1984.

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Of course most preschool classrooms do not have computers yet, but the trend is in this direction as evidenced by the frequent articles in educational journals and daily newspapers emphasizing the need. What is this campaign all about? Well, some educators and parents view this trend as an important beginning for young children to be socialized into our high technological society in which they must work and live competently on a daily basis. Other educators are more cautious and question whether preschools are becoming too "electric" or novel while also losing the developmental, more basic knowledge gained through manipulation of real objects in play. This latter group of educators stress that perception and differentiation are developed from direct interactions in time and space on a concrete level. Much of the current equipment and materials available for young children require them to use symbols for real objects within some electrically powered activity. These concerned educators warn us that this trend will evolve as "electric preschools" with children required to function symbolically before they progress from the innate concrete stages of knowing.

It is this controversy that sets the stage for this workshop. Dr. Houston and I [Dr. Lee] will explore the pros and cons of an ELECTRIC PRESCHOOL. First, let's define an electric preschool. An electric preschool is a classroom or center for children, ages three to five years old, in which the curriculum with its supportive activities, materials and equipment, depend more on technology that is powered by electricity during operation than on manually operated objects. The former experiences and equipment are

symbolic in nature and require a level of abstract thinking. The latter type of experiences and objects are concrete and place a child in the real world of the here and now. Any abstractions experienced within this concrete world are performed in relationship to the real world of daily living.

Second, let's set the stage for examining issues related to the electric preschool so that we can identify the advantages and disadvantages within the context of what we know about young children. Let's sketch a profile of how young children learn, the nature of their development, effective procedures of how their development can be facilitated, and the desired/realistic outcomes we can expect from certain procedures.

Most early childhood educators accept Barbara Vance's (1973) conceptualization of how children learn. Vance explains that within experiences (real or simulated) young children perceive what is going on or what they are doing. Next, they think about the event. Then, they perform some action, i.e., they do something related to the experience. Finally, they respond affectively to the activity as it is internalized emotionally. These processes occur almost simultaneously as children take in information through their senses, process that information mentally, carry out those thoughts motorically, and feel their reactions to it all. In summary, Vance purports that what children can perceive they can think about, what they think about they can do, and what they can do they also have feelings about.

And now, let's look more closely at the nature of learning and development. Eleanor Gibson, a psychologist in child development, helps us know the role of perception in learning (cognitive

development). According to Gibson (in Miller, 1983), activity is the basis of perception. Our environment is full of complex, relational units of stimuli [and the teacher must establish this type of environment if it doesn't exist naturally]. Within this milieu, it is the human nature to act upon these stimuli in order to learn about or from this affordable field of information. Active use of the senses during experiences serve to widen a child's ability to extract information from different situations. These explorations and experiments sharpen the child's ability to pick up information and use it.

Over time, experiences produce more and more information, i.e., the knowing becomes more exact, selective and efficient. Thus, the individual learns to detect distinctive features in stimulation in an economical manner, to extract invariants quickly, and to process large units of structure correctly.

The natural setting in which young children extract information is their play environment and its objects. Play, as we know from Piaget (in Ginsberg & Opper, 1969), is repeated activity that is a display of comprehended behavior. It is player-centered, i.e., player-initiated, player-paced, and player-styled (Gehlback,1976). Except for two impingements from adults, play is controlled almost entirely by children. Adults control children's play through their manipulation of the social and physical environments. That is, adults control the types of materials that are available for children to handle, and they structure the environments,i.e., position the furniture and the materials within the setting. These adult controlled manipulations also structure the interaction patterns in which children might play and also the modalities stimulated

by this environment and its objects.

In addition to controlling the physical features of the environment and thus, some of the social aspects of play, there are three management conditions teachers must apply in order to assure that children's play is educational. These conditions are:

1. Through verbal interactions, teachers must help children have an objective for play that includes some skill(s) and/or knowledge that gradually becomes more sophisticated from simple to complex; from sensory to more abstract.
2. Provision of time for practice in the application of this knowledge or in the exercise of the skill(s) so that the player persists in the activity for a period.
3. Delivery of discriminative feedback from the teacher (and sometimes, from the materials) that is referenced to the learner's objective, so that the learner is aware of the degree of his/her success. (Gehlback,1976)

PLAY administered in this way by teachers and experienced as described by children, fulfills what Piaget said young children need for cognitive, social, emotional and physical development. That is, Piaget explained that children need:

* to know their world motorically (children must act directly on objects and manipulate them correctly. It is this physical, accompanied by the mental processing of the inherent information that constitutes real knowing for children.
* have (or know) a level of understanding that is internal (psychological) activity on an intuitive

basis. Children perform mental actions on objects in abbreviated and internal ways as they play. a level of verbal understanding that accompanies their mental and physical actions. This verbal input from adults or older children helps them to express their mental operations in words.

Parents and some educators are apprehensive about leaving much of the control over play to young children in educational environments such as preschools. Gibson assures us that children learn within their environments whether adults participate in their activities or not. She emphasizes that adults are needed to help children make sense of their experiences but children extract information from the environment all by themselves. Two phenomena associated with the nature of stimulation and human beings contribute to this. First, information is inherent in stimulation (an array or field of available information in an environment). This information extends over time and space. It contains attributes that differentiate objects, their relational features, and their patterns concerning relationships among its parts. Children, like adults, naturally develop an ability to abstract information from the environment, filter this information, and attend to peripheral mechanisms in the environment.

Second, motivation is innate in active organisms. Thus, it is the nature of human beings to discover, explore, attend, extract information, and differentiate objects or events or spatial layouts in their environment. The goals and needs specific to each task or situation motivate what one takes-in or perceives.

The work of Montessori (in Standing, 1962) contributed

evidence that children must interact with objects in order to learn and learn how to learn. Their "work" with objects facilitates their learning to attend, concentrate, think critically, focus, differentiate, and perceive the available information. She concluded that objects and the opportunity to interact with them stimulate children's minds and thus, they can learn things beyond what we could tell them. Another value of providing objects for children to play with is described by Erik Erikson (1950, 1963). He pointed out that play with objects enable children to express their thoughts and feelings. They work out their conflicts, confusions, and feelings as they interact with and physically manipulate objects.

To summarize what we know about the developmental needs of young children, it's sound to say that preschoolers need stimulating, safe, environments that are managed by adults who: allow them to act on objects on a physical, mental and emotional level; and, also provide them with concrete objects and experiences that lend themselves to developmental activity.

The question becomes, to what extent have our preschools addressed these needs of children and fulfilled these roles of a good preschool teacher? According to the report by the National Commission on Excellence in Education (1983), there is a "current crisis in all education". The report continues with, "our society and its educational institutions seem to have lost sight of the basic purposes of schooling, ...". These observations include, of course, early childhood education.

It is stated in the report that the decline in the quality of education has our nation at risk, with minority and language

minority student [especially those who are poor] being the most at risk. These groups are the ones projects such as Head Start are designed to help the most so as to give these children a more equal opportunity to succeed in school along with more privileged youngsters. At the same time that our schools are failing many of our children, our society has advanced so that information to be comprehended has multiplied many-fold through the entry of computers. This report addressed this double problem thusly, "computers and computer-controlled equipment are penetrating every aspect of our lives---homes, factories, and offices --- [when] technology is radically transforming a host of other occupations ..."

In an article on the importance of computer-literacy for all of our citizens, Dr. Harleston (1983, p.95) stated that "we must teach for a global perspective and an international focus; and we must teach for technological literacy and intelligence, including critical thinking." It seems clear that computers are here to stay as a central component of our society. As such, our young children need to become familiar with them during their critical learning stages. This means that computer-literacy should begin in the preschools.

The question, then, is not "SHOULD COMPUTERS BE USED WITH YOUNG CHILDREN?" Instead, the question must be "to what extent should our young children have experiences with computers?" This more realistic inquiry embodies several important related questions such as: How much of the ECE curriculum should be experienced via the computer? Few educators, if any, want our young children to be plugged into a variety of machines during the course of their early education. Therefore, we must decide "what is the role of traditional play in the lives of children of today?" and "how can we

achieve a balance between regular play and use of computers?"

There are advantages and disadvantages for youngsters who begin computer-instruction and usage as a part of their preschool experiences. Let's look at some of these assets and liabilities as Dr. Houston examines actual and potential outcomes from preschoolers who use microcomputers within their early educational activities. Following this examination, we'll summarize with some implications and recommendations that should direct our progress regarding trends concerning COMPUTERS IN PRESCHOOLS for young children to use.

Pros and Cons of using computers with young children in preschool classrooms -- presented by Dr. Elizabeth Houston.

It is clear that our preschools must continue to be accountable relative to their mission to provide a good education for our youngsters. It is equally clear that a good preschool today and in the future must include one or more microcomputers. Teachers working in these good programs must be computer-literate and able to teach these skills to young children (meaning that they can teach children what a computer can and cannot do, how to operate the machine, programming procedures, and strategies for changing programs). The need for caution and responsible guidelines are recognized by early childhood educators and child advocates. Evidence of this is the fact that National ACYF (Head Start officials) is currently sponsoring a National Task Force to examine the feasi-

bility of allowing Head Start programs to place microcomputers in their classrooms for children to use. This Task Force will also offer recommendations to guide this process so that the integrity of the Head Start curriculum and experiences for children will be preserved and protected.

Based on current knowledge about the needs of young children for optimum development and some advantages/concerns relative use of computers with preschoolers, Dr. Houston and I (Dr. Lee) offer several recommendations to guide decision-makers regarding this topic. These suggestions are organized into the following categories to be carried out by:

ALL CHILD ADVOCATES --

1. Microcomputers should be provided for young children but this equipment should be viewed and used in classrooms just like other learning centers. Computers should be another center in the classroom that has the importance of say--the block area, the book center and the dramatic-play center, but also is implemented with teacher-input and techniques like those used in science lessons, language activities or math experiences. A structure is needed to assure that this balance is in the preschool curriculum as implemented in classrooms.
2. Individuals responsible for young children must also make certain that the welfare of preschoolers is addressed. This can be done although a major addition is being incorporated into ECE programs. We must establish guidelines and monitor programs to be sure that young children are receiving content

and skills needed to function successfully in today's world and in the future, while they also have opportunities to benefit from experiences proven to facilitate development. We cannot arrange for children to acquire new knowledge while they are deprived of the learnings we currently know they need such as an understanding of movement in time and space, balance, and speed.

THE NAEYC WORKSHOP PARTICIPANTS --

1. Use the information provided for you here today to guide your decisions or recommendations regarding the inclusion of computers in your centers and classrooms.
2. Work on task forces, committees and within your professional organizations to have impact on guidelines governing the purchase and use of computers in early childhood programs.
3. Use your knowledge about young children and computers to inform other citizens, especially legistrators and national policy-makers, of the cautions, needs, advantages, and negatives involved relative to computers and what is "good" for our preschoolers.

TEACHER EDUCATORS AT COLLEGES AND UNIVERSITIES --

1. Although there is currently too little time in teacher preparation programs for the content and skills we now teach, we must revise teacher education curricula to include computer-literacy for prospective teachers. This must be done without deleting the

strong features of teacher education as they are implemented now.

2. To be certain that the importance of child growth and development is preserved as salient in ECE, its content must be required as the perspective from which all ECE courses are taught; this is especially needed for methods courses and practicums.
3. Practicums for prospective teachers must include classrooms equipped with computers so that students can obtain guided experience as they practice teaching young children to use and learn with computers. These experiences must be provided throughout the training period and be accompanied by feedback from teacher educators. It is imperative that new teachers be able to facilitate all aspects of child development with competence and confidence.
4. Training for new teacher and veteran practitioners who are updating their methods, must include competencies relative to curriculum development and implementations. This knowledge must be given relative to the regular curriculum content and also use of the computer.
5. Use of the computer with young children must be incorporated in teacher preparation curricula in ways that enable prospective teachers to appropriately match their instruction with each child's learning style while also helping them teach child-

ren to become proficient in both relational and and analytical thinking styles.

NOTE: Use of computers for young children must mean that teachers are trained to teach preschoolers to program, debug, run operating programs on, and learn from programs via the computer.

EARLY CHILDHOOD TEACHERS --

1. Must be comprehensively trained about computers so that you know how computers are compatible with how young children think as well as how it is useful in assisting children in thinking in a variety of other helpful ways.
2. Should demonstrate competence in providing a good developmental program for young children before being required to expand to computer-instruction or to providing experieces using a computer.
3. Must be COMPUTER-LITERATE themselves!
4. Must be committed to facilitating total child development for today and for successful functioning in the future.

PARENTS --

1. Parents, especially minority and low-income parents, must be certain that their children acquire skills required to function successfully in mainstream America. The beginning of these skills should be experienced during the early critical learning periods when youngsters are at their optimum for acquiring languages (computerese) and cognitive skills.

2. Since instruction using computers has increased achievement for children, especially urban and low-income students, as demonstrated by increased achievement scores for children in the D.C. Public Schools (White 1984) and by Hungate (1982), parents should demand that their children receive instruction using computers.

3. Parents must demand that preschool curricula and materials used to implement them be balanced so that they facilitate all aspects of development whether its for the child's current stage of functioning or skills required for successful functioning in future stages.

Thank you for selecting this workshop. Now, we would appreciate learning from you. This period is scheduled for your comments, questions, concerns and sharing of experiences regarding the topic of this session. We welcome input from you, the people who are also struggling with this controversy from your vantage point in early childhood education.

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THE ELECTRIC PRESCHOOL

The electric preschool is regarded by many educators as the school with innovative programs, provides for creativity, motivation, individualized instruction, promotes self confidence and offers students a variety of learning experiences. The electric preschool as you know is described as using electrical or battery operated educational tools for teaching young children. These tools have been identified as the television, radio, typewriter, record player, video tape, 16 and 35 mm films and filmstrips, language masters, and micro computers. We have focused on these tools because all of them have educational values for learning. These tools can be used to accomplish the educational objectives classified by Bloom and others in the taxonomy of educational objectives. This classification system has 3 domains, (1) cognitive, (2, affective and (3 psychomotor. The Cognitive domain refers to knowledge, concept development, and intellectual skills from the simplest form (memorization) to the most complex (problem-solving). (Gilley & Gilley)

The Affective domain refers to interest, attitudes, values, feelings and

motions which influence whether a learning experience will be repeated and enjoyed.

The Psychomotor domain refers to movement and motor skills that are performed through conscious control of the individual.

This classification system suggest that there is a hierarchy in learning, that simple behaviors are present in each domain, they are logically learned and advance sequentially to the more complex. The electric teaching tools used in preschool follow this same pattern in order to reach the educational objectives desired for children.

Most early childhood educators have used some or all of the teaching tools described earlier in classrooms to enhance learning. However the most modern and widely discussed tool in this decade is the microcomputer. This tool is described as the learning device for the future by some and the most threating tool by others because of its capabilities and outlook for the future. The use of microcomputers enables one to do problem solving through enquiry, exploration, discovery and strategy. These uses satisfy the objectives in the cognitive domain described earlier. The microcomputer also allows for information handling through sorting,

evaluating, categorizing, recording and presenting. Activities in this category allows the user to accomplish objectives in the affective domain. The microcomputer also allows for programming, through analysis, ordering, sequencing and structuring.

The influence of micro computers will be felt significantly within the lives of our children in the future. The microcomputer is regarded by many as the leading technological advancement in education today. Additionally it is referred to as the most innovative and effective tool for use in the field of education within this decade.

A 1983 article in the Washington Post reported that the D.C. Board of Education will require all teachers and students in the system to be able to demonstrate proficiency in the use of computers and by 1987-88 students will be required to master such skills before they complete the 9th grade.

The extent to which computers can enhance the cognitive skills of preschoolers is an area of investigation which more research needs to be conducted. When used with young children, the micro computer can motivate children to be more creative as they draw upon other acquired skills. Computers can also be programmed to teach cognitive skills such as colors,

math, language arts, vocabulary and perceptual skills as well as thinking games. All of these are regarded as the first step toward computer literacy for children. Children learn that computers are an integral part of the world and they learn about the keyboard, cursor, disk and other aspects of computer use. Children have been observed to be far more comfortable using the computers than most adults.

Seymor Papert, author of Mindstorm; children, computers and powerful ideas, maintained that almost every thing of value that is taught under the heading of mathematics in school could be learned fairly spontaneously by children in a computer rich environment. Papert believes that children who use computers and logo will teach themselves mathematics as easily and naturally as they would learn to speak French by living in France. Papert further maintained that children who are exposed to computers and logo will be better thinkers, more logical and better able to write as well as compute, thus more confident in their own powere and skills to succeed.

PROS OF THE ELECTRIC PRESCHOOL

** provide variety to the classroom teaching
** action oriented
** immediate feedback
** individualized as well as group instruction
** helps to meet educational objectives, cognitive, affective & psychomotor
** holds children's interest longer
** encourages partipation through discovery
** used to supplement every aspect of the preschoo curriculum
** when properly planned by the teacher, these tools cam make learning fun for most children.

PROS OF THE MICRO COMPUTER

In addition to the items just mentioned, the following are appli to the micro computer.

** used to explore and discover
** learn about properties, directions, location in space
** give children experiences they cannot normally have through simulation
** to overcome certain physical barriers or machanical barriers (ex, writing)
** allows children to learn graphic designs, colors drawings
** gives immediate feedback children can identify with
** control pace of the lesson
** excellent motivator
** allows for problem selving
** requires children to engage in decision making

** is a machine of infinite patience, does not tire of child's repetitive questions or of the child who cannot get the right answer.

** can present materials in different ways and thus give children wider experiences

** hold the attention of the child longer than most teaching tools

** allows children to work cooperately with one another and this interaction stimulates the development of language skills.

** the earlier a child is introduced to the micro computer, the more confortable he/she will feel using this new technology.

CONS OF THE ELECTRIC PRESCHOOL AND THE MICRO COMPUTER

In a September, 1983 article reported in the Washington Post by Vivian Alplin-Brownlee entitled Poor Kids, Computers are the newest disadvantage, Ms Brownlee indicated that poor kids are being left behind in this race for computerized classrooms. A study by the University of Minnesota found that the nations 12,00 most affluent school districts are 4 times more likely than students in the 12,00 poorest districts to have access to computers. Ms Brownlee's article also points out that to the extent computer literacy and computer expertise are necessary for success in getting and keeping jobs, computer inequity is a serious problem. It threatens to seperate groups and communities by giving some people more effective tools for living in the computer age. Moreover, the congressional office of Technology assessment issued a warning that "if the technologies are primarily designed for and made available to middle class families, they could increase rather than

diminish the gap between the educationally advantaged and disadvantaged". Alvin Toffler, author of Future Shock maintained that kids who know how to use computers will have an edge over those who don't, and this means that unless conscious steps are take, white middle class children will start out, once more, with an edge that the less affluent lack.

Additional cons

** will take the place of the teacher

** children need more hands on experiences

** limits verbal communication skills when used alone

** easy to protray stereotype images

** children will spend less time reading when computers are used

There are still several questions concerning the claims for success with micro computers. These questions can now be answered through research. March/April, 1983 edition of Journal of Childhood Education posed 4 basic question for your consideration.

1. Do students learn more through computer-assisted instruction (CAI)?
2. Does the use of computers stifle independedt thinking and creativity?
3. Does the use of computers prevent children's development of social skills through isolation with a machine?

4. Do computers intimidate students and decrease their learning initiative?

SUMMARY _ THE COMPUTER AND THE CURRICULUM

Unless the computer is an aid to the child it is a complete waste, a waste not only of money but also of the children's valuable time according to Peter Wayth, 1983. If the computer can be shown to assist the teacher by improving the learning environment of the child then it should be a very welcomed addition to the classroom. Computers are an every day part of todays world. How computers are used to aids or supplement the instruction is a critical issue. Education is a many faceted activity and through this process children learn about the past, use the present and prepare for the future. Computers are an integral part of the present, and will be even more prevalent in the future. The questions should not be shall educators use computer instruction in the classroon but rather, How shall parents and educators choose approaches for computer instruction?

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